claims

1. An adaptive array antenna system, comprising:

modulation means having a plurality of modulators for generating transmitting data corresponding to the number of users;

beam forming means having a plurality of beam formers for generating a multiplexed data by multiplexing the generated transmitting data to a beam forming weight;

vector addition means for generating sum data by adding outputs of the beam forming means corresponding to a user;

array error compensation means for generating error compensated data by multiplexing a reverse of a transfer function of an array transmitting means to the sum data from the vector addition means by using a compensation signal inputted through a frequency down conversion means;

array linearization means for receiving the error compensated data from the array error compensation means, generating linearized signal by linearizing the error compensated data by using the compensating signal from the frequency down conversion means and transferring the linearized signal to the array transmitting means;

compensation signal extraction means for extracting a compensation signal from an output signal of the array transmitting means and outputting the compensation signal;

frequency down conversion means for generating a converted signal by frequency-down converting the compensation signal;

array transmitting means for converting the linearized signal from the 0array linearization means to an analogue linearized signal and frequency-up converting the analogue linearized signal; and

array antenna for transmitting an output signal passed through the compensation signal extraction means.

2. The adaptive array antenna system as recited in

claim 1, the array error compensation means includes:

error compensation signal generation means for generating a digital error compensation signal to be injected to a channel in order to estimate the transfer function of the array transmitting means;

error compensation signal injection means for generating digital transmitting data by adding an output vector of the vector addition means and a vector of the digital error compensation signal vector;

error compensation coefficient estimation means for estimating an error compensation coefficient of each channel by considering relation between the compensation signal from the frequency down conversion means and the error compensation signal generated from the error compensation signal generation means; and

error compensation means for multiplexing a reverse of the error compensation coefficient to the digital transmitting data generated from the error compensation signal injection means in each transmitting channel of the array transmitting means and transferring a result of the multiplexing to the array linearization means.

3. The adaptive array antenna system as recited in claim 1, wherein the array linearization means includes:

non-linear coefficient extraction means for receiving an output signal of the array error compensation means, comparing the output signal and the compensating signal from the frequency down conversion means and extracting the non-linear coefficient; and

pre-distortion means for linearizing the error compensated signal from the array error compensation means by multiplexing the extracted non-linear coefficient to the array error compensated signal.

4. The adaptive array antenna system as recited in claim 3, wherein the error compensation coefficient is the transfer function of the array transmitting means.

5. The adaptive array antenna system as recited in claim 3, wherein an updating period of error compensation coefficient is faster than an updating period of the non-linear coefficient.

6. A linearization method of an adaptive array antenna system, the linearization method comprising the steps of:

a) generating transmitting data corresponding to the number of users;

b) generating multiplexed data by multiplexing the transmitting data with a beam forming weight;

c) generating sum data by adding the multiplexed data;

d) generating error compensated data by compensating the transmitting signal by frequency down converting an output signal of the adaptive array antenna system; and

e) linearizing the error compensated data from the step d) by frequency-down converting the compensation signal and the output signal of the adaptive array antenna system.

7. The method as recited in claim 6, wherein the step d) includes the steps of:

d-1) generating a digital error compensation signal to be injected to a channel in order to estimates a transfer function of an array transmitting means in the adaptive array antenna system;

d-2) generating digital transmitting data by adding the sum data from step c) and the digital error compensation signal from the step d-1);

d-3) estimating an error compensation coefficient by considering a relation between the frequency down converted compensation signal and the digital error compensation signal; and

d-4) multiplexing the digital transmitting signal form the step d-2) and a reverse of the error compensation

coefficient from the step d-3).

8. The method as recited in claim 6, wherein the step d-2) includes:

d-2-I) receiving the error compensated signal from the step d), comparing the error compensated signal and the frequency down compensated signal and extracting the non-linear coefficient; and

d-2-II) linearizing the error compensated signal from the step d) by multiplexing the extracted non-linear coefficient.

9. The method as recited in claim 8, wherein an updating period of error compensation coefficient is faster than an updating period of the non-linear coefficient.

10. The method as recited in claim 8, wherein the error compensation coefficient is the transfer function of the array transmitting means.